

Introducing Actions/Recommendations from CGMS to the 14th International Winds Workshop



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with IWWG co-chairs
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Welcome to IWW14!

Thank You!!

- To KMA/National Meteorological Satellite Center (NSMC) for hosting this workshop and to Sung-Rae Chung (KMA/NSMC; local coordinator)
- To our IWWG co-chairs, Regis Borde (EUMETSAT) and Steve Wanzong (U/W CIMSS)
- To all of you for your contributions and attendance at this and past workshops
- To our meeting sponsors: WMO, KMA, EUMETSAT, NOAA, BAE Systems



OUTLINE

- **CGMS International Science Working Groups**
- **Actions and Recommendations from CGMS-45**
- **Other Items of Relevance to CGMS**

The Five International Science Working Groups under CGMS

- **ITWG:** The International TOVS Working Group is also convened as a sub-group of the Radiation Commission of the International Association of Meteorology and Atmospheric Sciences (IAMAS). ITWG continues to organize International TOVS Study Conferences (ITSCs) which have met every 18-24 months since 1983.
- **IWWG:** The International Winds Working Group was established in 1991 and became a Working Group of CGMS in 1994.
- **IPWG:** The International Precipitation Working Group was established as a permanent Working Group of the Coordination Group for Meteorological Satellites (CGMS) in June 2001.
- **IROWG:** The International Radio Occultation Working Group was established as a permanent Working Group of CGMS at the 37th meeting in October 2009.
- **ICWG:** The International Cloud Working Group was established as a permanent Working Group of CGMS at the 42nd meeting in May 2014.



CGMS-45 Actions for IWWG

CGMS High Level Priority Plans (HLPPs) have been updated for the period 2017-21.

HLPP 3.2.1:

Establish commonality in the derivation of AMV for global users where appropriate (e.g., through sharing of prototype algorithms) and consider backwards compatibility when designing AMV algorithms for the 16-channel imagers, so that present state-of-the-art algorithms can be applied to old imagery.

- Establishing commonality in AMV derivation among satellite operators has been a long standing goal.
- Backwards compatibility
 - Consistent products generated for different satellites/instruments
 - Opens up opportunities for reprocessing efforts
- Common QI software shared for the 3rd AMV Inter-comparison study

➤ Discuss status at IWW14 and report back to CGMS-46

CGMS-45 Actions for IWWG

CGMS High Level Priority Plans (HLPPs) have been updated for the period 2017-21.

HLPP3.2.2:

Continue research into improved derivation and assimilation of high resolution winds for use in high resolution data assimilation and nowcasting. ICWG and IWWG to liaise as appropriate on the provision of further information characterising the AMV derivation for enhanced QC and error characterisation

- Lot of discussion on this topic at IWW13 and IWW12 (derivation methods, quality control, utility of cloud retrieval information, etc)
 - This topic is especially relevant now with the increasing numbers of advanced imagers and sounders in GEO orbit. What have we learned? What is the way forward?
- **Discuss at IWW14 and report back to CGMS-46**

CGMS-45 Actions for IWWG

A45.02 to CGMS space agencies, IROWG, IPWG, IWWG, ICWG, ITWG: CGMS International Science Working Groups and CGMS space agency members to formulate science questions, including the impact of data latency, in view of the 7th Impact Workshop in 2020 (ref. CGMS-45-WMO-WP-02) and provide these to Iriishojgaard@wmo.int

- From CGMS-45 Final Report:

In view of the 7th NWP Impact Workshop scheduled for 2020, CGMS highlighted that the scientific question on the impact of data latency from polar-orbiting satellite data from NWP needs to be raised. CGMS recognised the increased complexity in carrying out such experiments, particularly the simulation of NRT data flows with technical issues related to observations timestamping. The impact of reduced latency from secondary missions should also be considered in future studies, noting that SNPP, JPSS-1 and eventually JPSS-2 will fly in parallel, and it will be instructive to investigate the expected benefit of low latency of parallel data streams on NWP.

- From Lars Peter Riishojgaard (WMO):

“CGMS has largely done its job I think - it is clear that data latency is an important issue and the impact of various levels of latency is expected to be featured at the next Workshop”

CGMS-45 Actions for IWWG

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- **From the perspective of satellite-derived winds, what things would we as a group be interested in having NWP look at and assess? Some examples:**
 - Impact assessments of AMVs at varying resolutions, higher refresh rates, etc in global and regional NWP systems
 - Assess impact of AMVs whose heights are assigned via geometric techniques (e.g., stereo cloud heights)
 - Assess impacts of 3D winds (e.g., Aeolus Doppler Winds)
 - Other?
- **Discuss at IWW14 and report back any further input to WMO and report back to CGMS-46**

CGMS-45 Actions for IWWG

A45.12 to IWWG: IWWG to prepare a proposal to CGMS on how to fund the analysis of the future AMV International Inter-comparison studies.

- Javier García Pereda has indicated that AEMET, through the EUMETSAT NWC SAF will continue to fund the future Inter-comparison projects into the 2020's.
- **IWWG co-chairs propose to close this action at CGMS-46**

CGMS-45 Actions for IWWG

ACTION from CGMS WG-II (Satellite Data and Products): IWWG to liaise with the NOAA representative on the WMO Polar Space Task Group (PSTG) (Jeff Key, jeff.key@noaa.gov) regarding the potential use of 3D winds from AIRS for Year of Polar Prediction (YOPP) studies.

Dave Santek (UW-Madison/SSEC) Inputs to Jeff Key:

- AIRS 3D AMVs should be considered for the Year of Polar Prediction (YOPP)
- In Dave's presentation at the NASA Sounder Science Team meeting (October 2017), he showed results of data assimilation and forecasts experiment that he ran, and independent evaluations by Randy Pauley (FNMOC) and Will McCarty (GMAO). The results were consistent: The observation departures from the background were similar to that of the MODIS polar winds.
- Dave's forecast experiment (using the GEOS-5) showed an improvement (although not statistically significant) in the northern hemisphere 500 hPa Anomaly Correlation Coefficient (ACC) beyond 4 days, which was encouraging considering the 3D winds are only poleward of 70 deg. latitude.
- At the Sounder meeting, Will McCarty indicated that he was considering routine assimilation of the winds into the GEOS-5.
- Proposals from Dave have been submitted to improve the product and extend it to other sensors (CrIS, IASI) which will result in increased spatial and temporal coverage.
- UW-Madison/SSEC/CIMSS is producing the product in real-time, with the same latency as the other polar winds products.



CGMS-45 Actions for IWWG

A43.12 to IWWG: IWWG to liaise with the application focal points in the WMO Rolling Review Requirements (RRR) process (on IPET-OSDE) to provide feedback on the winds-related observation requirements in the RRR database.

This is a follow-on action to the IWWG...

Reported by IWWG to CGMS-45:

Inputs from the IWWG for the WMO OSCAR Database regarding the 'wind (Horizontal)' capabilities have been provided to the WMO in November 2016.

Several updates have been proposed, mainly concerning the gap analysis due to the recent production of new wind products at high latitudes (Leo-Geo, Single and Global AVHRR wind products). The global AVHRR wind product extracted from dual Metop operation also has global coverage. Moreover, 3D winds are presently produced over Polar Regions in a demonstration mode at CIMSS from the AIRS instrument.

CGMS-45 Actions for IWWG

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Some background related to the follow-on action:

Under the auspices of the WMO Commission for Basic Systems (CBS), the Inter Programme Expert Team on the Observing System Design and Evolution (IPET-OSDE) prepared an implementation plan (Nov 2016) that **provides background in terms of requirements and recommendations for a functional and robust Global Climate Observing System (GCOS).**

“THE GLOBAL OBSERVING SYSTEM FOR CLIMATE: IMPLEMENTATION NEEDS”

(<https://public.wmo.int/en/programmes/global-climate-observing-system>)

- Now there is a need to follow up on winds related observation requirements

➤ **Discuss at IWW14 and report back to CGMS-46**

Other Items of Relevance to the CGMS

IWW12.4 - IWWG community to agree a new standard BUFR template, which when rolled out should be adopted by all producers.

- New BUFR Table development completed and formally approved by the WMO in November 2017.
- Producers and users should work towards adopting now
 - Recalling IWW13 WG2 recommendations:
 - NESDIS: to make offline test data available for the new BUFR template as soon as possible once it has been approved by WMO (e.g., 1 time slot would be sufficient) for technical testing/implementation.
 - A 3 month overlap period of providing the same data in the new and old format should be provided, assuming the above-mentioned test data has been provided 9 months earlier.
- Some History
 - Original winds BUFR sequence was established ~20 years ago
 - Many AMV algorithm updates or totally new algorithms since then
 - New winds BUFR sequence is better organized
 - New variables are now available for output that are potentially useful in NWP data assimilation of satellite derived winds (e.g., Retrieved cloud parameters, Error characterization)

Other Items of Relevance to the CGMS

IWWG 3rd AMV Inter-comparison Study

- Results to be presented at IWW14
- Thanks to all contributors and to Javier Garcia (NWC/SAF AEMET) and Dave Santek (U/W CIMSS) for collecting and performing the comparison assessment

A key goal of these AMV inter-comparison studies is to learn and understand similarities and differences in AMVs produced at different operational centres, and ultimately, to improve their quality and consistency.

Done in close coordination with ICWG which is vitally important and should continue

Other Items of Relevance to the CGMS

IWW13.5 - AMV producers to provide higher-density AMV products that capture small-scale detail for mesoscale applications. Rapid scan configurations are particularly suitable for this.

- This is an important, exciting, but complex topic. Research should continue.
- The advent of the next generation geostationary imagers with higher spatial, temporal and spectral resolution will bring unprecedented opportunities to generate winds at smaller scales at higher cadence that can be used to improve the initialization of the atmospheric state within regional NWP systems.
- Development of high resolution winds and an accompanying assimilation strategy are needed for improving forecasts of high impact weather events using high resolution models.

➤ **Plenary Discussion at IWW14 on Tuesday (led by Mary and Roger)**